CLAIMS

What is claimed is:

1. A water-based acrylic emulsion dispersant for efficient wetting and grinding of a pigment, said acrylic emulsion dispersant comprising the reaction product of:

an ethylenically unsaturated monomer;

a vinylaromatic hydrocarbon monomer;

a non-functional polyalkylene glycol acrylate or methacrylate monomer,

a functional polyalkylene glycol acrylate or methacrylate monomer having a hydroxyl group; and

an acid having a first functional acid group reactive with said hydroxyl group, and a second functional acid group capable of providing an acid anion group.

2. An acrylic emulsion dispersant as set forth in claim 1 further comprising an amine for neutralizing said second functional acid group to provide said acid anion group.

3. An acrylic emulsion dispersant as set forth in claim 2 wherein said amine is selected from the group consisting of dimethylethanolamine and amino methyl propanol, and mixtures thereof.

4. An acrylic emulsion dispersant as set forth in claim 1 wherein said ethylenically unsaturated monomer is present in an amount from 30 to 60 parts by weight based on 100 parts by weight of total monomer composition.

5. An acrylic emulsion dispersant as set forth in claim 1 wherein said ethylenically unsaturated monomer is selected from the group of compounds consisting of aliphatic acrylates, aliphatic methacrylates, cycloaliphatic acrylates,

cycloaliphatic methacrylates, and mixtures thereof, each of said compounds having up to 20 carbon atoms in the alkyl radical.

6. An acrylic emulsion dispersant as set forth in claim 5 wherein said aliphatic acrylates are selected from the group consisting of methyl acrylate, ethyl acrylate, propyl acrylate, butyl acrylate, hexyl acrylate, ethylhexyl acrylate, stearyl acrylate, lauryl acrylate, and mixtures thereof.

7. An acrylic emulsion dispersant as set forth in claim 5 wherein said aliphatic acrylates are present in an amount from 15 to 30 parts by weight based on 100 parts by weight of total monomer composition.

8. An acrylic emulsion dispersant as set forth in claim 5 wherein said aliphatic methacrylates are selected from the group consisting of methyl methacrylate, ethyl methacrylate, propyl methacrylate, butyl methacrylate, hexyl methacrylate, ethylhexyl methacrylate, stearyl methacrylate, lauryl methacrylate, and mixtures thereof.

9. An acrylic emulsion dispersant as set forth in claim 5 wherein said aliphatic methacrylates are present in an amount from 15 to 30 parts by weight based on 100 parts by weight of total monomer composition.

10. An acrylic emulsion dispersant as set forth in claim 5 wherein said cycloaliphatic acrylate is further defined as cyclohexyl acrylate.

11. An acrylic emulsion dispersant as set forth in claim 5 wherein said cycloaliphatic methacrylate is further defined as cyclohexyl methacrylate.

12. An acrylic emulsion dispersant as set forth in claim 1 wherein said vinylaromatic hydrocarbon monomer is selected from the group consisting of styrene, α-methylstyrene, vinyltoluene, diphenylethylene, and mixtures thereof.

13. An acrylic emulsion dispersant as set forth in claim 1 wherein said vinylaromatic hydrocarbon monomer is present in an amount from 5 to 20 parts by weight based on 100 parts by weight of total monomer composition.

14. An acrylic emulsion dispersant as set forth in claim 1 wherein said non-functional polyalkylene glycol methacrylate monomer is further defined as methyl ether polyethylene glycol methacrylate.

15. An acrylic emulsion dispersant as set forth in claim 1 wherein said non-functional polyalkylene glycol methacrylate monomer is present in an amount from 1 to 15 parts by weight based on 100 parts by weight of total monomer composition.

16. An acrylic emulsion dispersant as set forth in claim 1 wherein said non-functional polyalkylene glycol acrylate monomer is present in an amount from 1 to 15 parts by weight based on 100 parts by weight of total monomer composition.

17. An acrylic emulsion dispersant as set forth in claim 1 wherein said functional polyalkylene glycol methacrylate monomer having a hydroxyl group is selected from the group consisting of polyethylene glycol methacrylate, polypropylene glycol methacrylate, and mixtures thereof.

18. An acrylic emulsion dispersant as set forth in claim 1 wherein said functional polyalkylene glycol methacrylate monomer having a hydroxyl group is present in an amount from 25 to 40 parts by weight based on 100 parts by weight of total monomer composition.

19. An acrylic emulsion dispersant as set forth in claim 1 wherein said functional polyalkylene glycol acrylate monomer having a hydroxyl group is present in an amount from 25 to 40 parts by weight based on 100 parts by weight of total monomer composition.

20. An acrylic emulsion dispersant as set forth in claim 1 wherein the molar ratio of said ethylenically unsaturated monomer to said vinylaromatic hydrocarbon monomer is from 1 : 1 to 10 : 1.

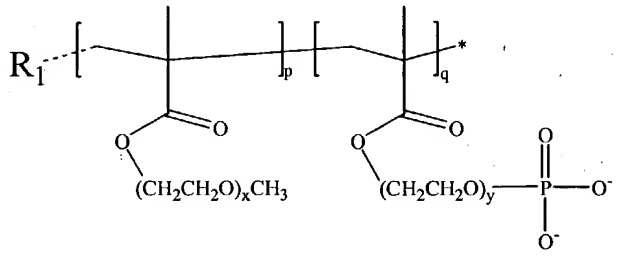
21. An acrylic emulsion dispersant as set forth in claim 1 wherein the molar ratio of said functional polyalkylene glycol methacrylate monomer having a hydroxyl group to said non-functional polyalkylene glycol methacrylate monomer is from 5 : 1 to 15 : 1.

22. An acrylic emulsion dispersant as set forth in claim 1 wherein said acid having said first and second functional acid groups is selected from the group consisting of polyphosphoric acid, sulfuric acid, sulfurous acid, and dicarboxylic acids.

23. An acrylic emulsion dispersant as set forth in claim 1 having a molecular weight of from 10,000 to 100,000.

24. An acrylic emulsion dispersant as set forth in claim 1 having a non-volatile content of from 20 to 40 percent non-volatile by weight.

25. A water-based acrylic emulsion dispersant for efficient wetting and grinding of a pigment, said acrylic emulsion dispersant being of the general formula:



wherein;

R_1 is a polymer chain containing monomers selected from the group consisting of ethylenically unsaturated monomers and vinylaromatic hydrocarbon monomers, and mixtures thereof;

p and q are from 1 to 100; and

x and y are from 5 to 50.

26. An acrylic emulsion dispersant as set forth in claim 25 wherein said ethylenically unsaturated monomers are selected from the group consisting of compounds consisting of aliphatic acrylates, aliphatic methacrylates, cycloaliphatic acrylates, cycloaliphatic methacrylates, and mixtures thereof, each of said compounds having up to 20 carbon atoms in the alkyl radical.

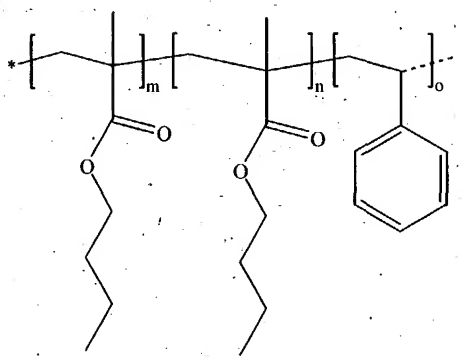
27. An acrylic emulsion dispersant as set forth in claim 26 wherein said aliphatic acrylates are selected from the group consisting of methyl acrylate, ethyl acrylate, propyl acrylate, butyl acrylate, hexyl acrylate, ethylhexyl acrylate, stearyl acrylate, lauryl acrylate, and mixtures thereof.

28. An acrylic emulsion dispersant as set forth in claim 26 wherein said aliphatic methacrylates are selected from the group consisting of methyl methacrylate, ethyl methacrylate, propyl methacrylate, butyl methacrylate, hexyl methacrylate,

ethylhexyl methacrylate, stearyl methacrylate, lauryl methacrylate, and mixtures thereof.

29. An acrylic emulsion dispersant as set forth in claim 25 wherein said vinylaromatic hydrocarbon monomers are selected from the group consisting of styrene, α-methylstyrene, vinyltoluene, diphenylethylene, and mixtures thereof.

30. An acrylic emulsion dispersant as set forth in claim 25 wherein R_1 is further defined as



wherein;

m, n, and o are from 1 to 100.

31. A water-based acrylic emulsion dispersant for efficient wetting and grinding of a pigment, said acrylic emulsion dispersant comprising the reaction product of:

an ethylenically unsaturated monomer;

a vinylaromatic hydrocarbon monomer;

a non-functional monomer selected from the group consisting of non-functional polyalkylene glycol methacrylate monomers and non-functional polyalkylene glycol acrylate monomers;

a functional monomer selected from the group consisting of functional polyalkylene glycol methacrylates having a hydroxyl group and functional polyalkylene glycol acrylate monomers having a hydroxyl group; and

an acid having a first functional acid group reactive with said hydroxyl group, and a second functional acid group capable of providing an acid anion group.